Examining the Correlation between the Types of Businesses near BLUEbikes Stations and the Proportion of Subscriber Trips to Total Trips using those Stations

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Question

Is there a relationship between the proportion of subscriber rides to total rides ending at a station and the types of businesses within a half-mile radius of that station (office, food, recreation, etc.) in 2019?

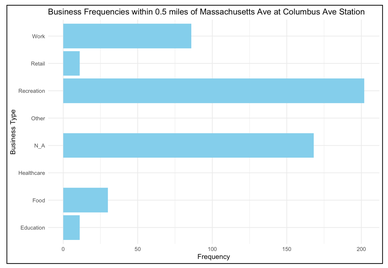
Introduction

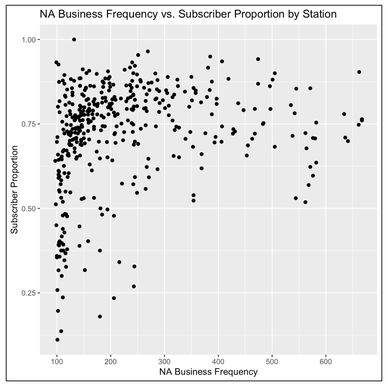
- BLUEbikes offers bikes for use as public transportation within the greater Boston area
- Users can be subscribers or casual riders
  - Subscribers pay monthly or yearly with unlimited trips
  - Casual riders pay by the trip
- Overpass Turbo is an online query service that uses OpenStreetMaps data to search the area around a given latitude and longitude for buildings and features that match the given query parameters
- ## previous research here ##
- Why is this relevant?
  - Evidence of a relationship could allow BLUEbikes to consider business frequencies when considering new station locations
  - Provides more information about how people are using BLUEbikes, which could help for marketing, updating existing stations, determining available plans, etc.
- Subscriber proportions are calculated by dividing the number of trips that ended at a given station that were taken by subscribers with the total number of trips that ended at that station
- ## NOT DONE ##

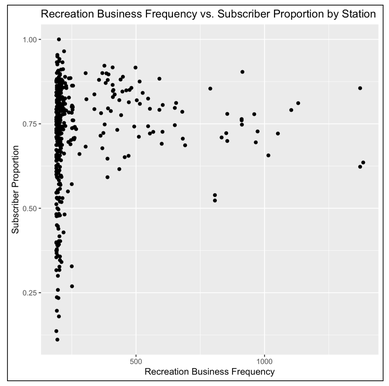
Methods

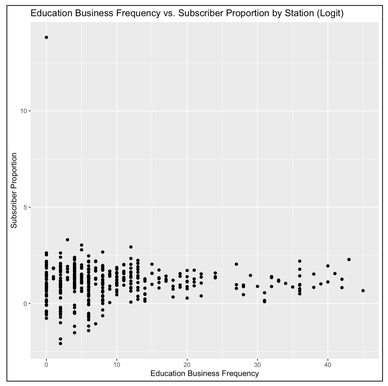
1. Download 2019 trip data from BLUEbikes
2. Use Python to get unique stations and calculate the subscriber proportion
3. Use R to query Overpass Turbo to get business data within 0.5 miles of a station
4. Use R to create scatterplots comparing business type frequency to subscriber proportion
5. Use R to run linear/multiple linear regression
   1. Use each business type separately and then combined
6. Compare model efficacy using R^2 and other indicators
7. Use R to run k-fold cross-validation to create a prediction model
8. Compare model efficacy using prediction error

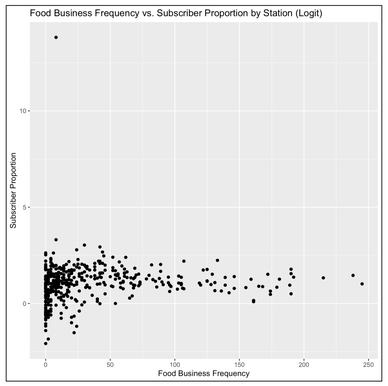
Results

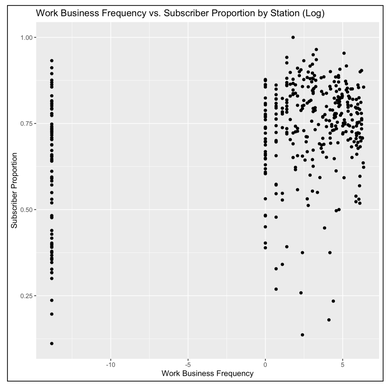


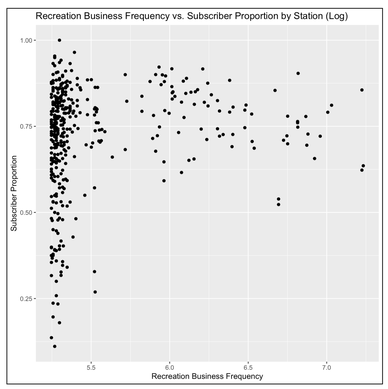


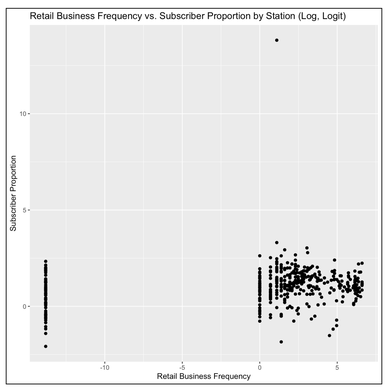


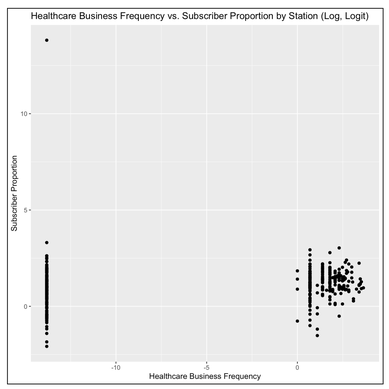












Results

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Conclusions

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References

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